इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 6341 (1971): Method of laboratory test for efficacy of wood preservatives against soft rot [CED 9: Timber and Timber Stores]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

(Reaffirmed 2002)

Indian Standard

METHOD OF LABORATORY TEST FOR EFFICACY OF WOOD PRESERVATIVES AGAINST SOFT ROT

(Second Reprint DECEMBER 1985)

UDC 674.048:620.193.82

© *Copyright* 1972

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2

May 1972

Indian Standard

METHOD OF LABORATORY TEST FOR EFFICACY OF WOOD PRESERVATIVES AGAINST SOFT ROT

Timber Sectional Committee, BDC 9

Chairman	*Representing*
Shri R. C. Soni	Ministry of Agriculture
Members	
Shri Y. P. Bawa	Directorate General of Civil Aviation (Ministry of Tourism & Civil Aviation)
Shri B. K. Bhalla	The Western India Match Company Ltd, Bombay
Shri Bimal Nag	Assam Railway & Trading Company Ltd, Margherita (Assam)
Shri G. C. Das	National Test House, Calcutta
Deputy Inspector General of Forests	Ministry of Agriculture
Shri V. N. Deshpande	Engineer-in-Chief's Branch (Ministry of Defence)
Director, Naval Construction	Naval Headquarters (Ministry of Defence)
Joint Director (Timber)	Ministry of Railways
Dr Joseph George	Indian Plywood Industries Research Institute, Bangalore
Dr D. C. Roy (*Alternate*)	
Shri K. S. Lauly	The Federation of Indian Plywood and Panel Industry, New Delhi
Shri K. S. Nair (*Alternate*)	
Shri J. S. Matharu	Directorate General of Technical Development (Ministry of Industrial Development)
Shri J. N. Mullick	Forest Department, Government of Himachal Pradesh
Dr A. N. Nayer	Ministry of Defence (R & D)
Shri U. B. Kanchan (*Alternate*)	
President	Forest Research Institute & Colleges, Dehra Dun
Shri K. Ramesh Rao	Forest Research Institute & Colleges (Wood Anatomy Branch), Dehra Dun
Dr A. V. R. Rao	National Buildings Organization (Ministry of Works & Housing)
Dr R. S. Ratra (*Alternate*)	
Maj G. S. Saini	Ministry of Defence (DGI)
Shri D. P. Ghosh (*Alternate*)	
Shri A. C. Sekhar	Forest Research Institute & Colleges (Timber Mechanics Branch), Dehra Dun

(*Continued on page* 2)

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

(*Continued from page* 1)

Members	*Representing*
Shri N. K. Sharma	Forest Department, Government of Madhya Pradesh
Shri R. C. Saxena (*Alternate*)	
Shri S. M. Sibtain	Forest Department, Government of Uttar Pradesh
Shri M. Swarup	Paharpur Timbers Private Ltd, Calcutta
Shri D. Ajitha Simha, Director (Civ Engg)	Director General, ISI (*Ex-officio Member*)

Secretary

Shri K. M. Mathur
Assistant Director (Civ Engg), ISI

Timber Seasoning and Treatment Subcommittee, BDC 9 : 3

Members	
Additional Chief Engineer, Directorate of Telegraphs (L)	Directorate General of Posts & Telegraphs, New Delhi
Divisional Engineer Telegraphs (C) (*Alternate*)	
Shri P. Barua	Forest Department, Government of Assam
Chief Conservator of Forests	Agriculture and Forest Department, Government of Maharashtra
Chief Conservator of Forests	Agriculture and Forest Department, Government of Mysore
Forest Utilization Officer (*Alternate*)	
District Forest Officer, Saw Mill Division, Rajahmundry	Forest Department, Government of Andhra Pradesh
Joint Director (Timber)	Ministry of Railways
Shri S. K. Kapur	Defence Production (DGI) (Ministry of Defence)
Shri N. K. Maity	Shalimar Tar Products (1935) Ltd, Calcutta
Shri S. Roy (*Alternate*)	
Shri J. S. Matharu	Directorate General of Technical Development (Ministry of Industrial Development)
Shri S. N. Sharma	Forest Research Institute & Colleges, Dehra Dun
Shri V. R. Sonti	Ascu Hickson Private Ltd, New Delhi
Shri S. Shivaji (*Alternate*)	

Indian Standard

METHOD OF LABORATORY TEST FOR EFFICACY OF WOOD PRESERVATIVES AGAINST SOFT ROT

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 25 November 1971, after the draft finalized by the Timber Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Details of preservatives and method of preservative treatment of timber have been covered in IS: 401-1967*. This standard covers the method of laboratory test for efficacy of such wood preservatives against soft rot.

0.3 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to the practices in the field in this country.

0.4 In the preparation of this standard valuable data was supplied by the Forest Research Institute & Colleges, Dehra Dun.

0.5 In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS: 2-1960†.

1. SCOPE

1.1 This standard covers the method for determininig the relative fungicidal value of wood preservatives against soft rot in the laboratory.

2. PRINCIPLE

2.1 Blocks of wood are impregnated with an appropriate series of concentration of a preservative, and after selected period of leaching, they are exposed to the action of microfungi that causes soft rot. The minimum amount of preservative that completely protects the impregnated blocks against decay by the given test fungus is defined as **threshold value**. The

---

*Code of practice for preservation of timber (*second revision*).

†Rules for rounding off numerical values (*revised*).

failure to protect is determined by the amount of weight loss in the treated wood blocks. While soft rot is known to be caused by a number of micro-organisms and it occurs both in non-coniferous and coniferous wood, experience of laboratory test procedures has been gained only for one fungus, that is, *Chaetomium globosum* Kunze on coniferous wood.

3. PREPARATION OF TEST SAMPLES

3.1 Test Blocks — The test blocks of size 5·0 × 2·5 × 0·5 cm with long axis parallel to the grain of the wood shall be prepared from mango (*Mangifera indica*. Linn) free from knots, mould and stain, etc. The blocks are then dried in an oven at 100 to 105°C to a constant weight (W_1). Twelve blocks shall be treated with each concentration of preservative usually 6 in number. The concentration of the preservative which should be prepared on a weight/weight basis should be chosen so that approximately half of the series fall above and half below the expected threshold value. In case of new preservatives it may be helpful to carry out preliminary tests using wide intervals in the retention gradient chosen and then repeating the test using closer gradient intervals at the approximate threshold value.

3.2 Treatment Procedure — The blocks kept in a beaker under a weight to prevent floating shall be placed in a desiccator connected to a manometer and a suction pump. A partial vacuum (60 mm Hg residual pressure) shall be created in the desiccator for 30 minutes. The treating solution just prior to its use shall be poured into the globe of the separating funnel with its stem extending the beaker containing the blocks. The preservative solution shall then be run into the beaker completely covering the blocks. The vacuum shall then be released. The beaker shall be taken out and covered with a lid to prevent evaporation of the preservative solution. The blocks shall be allowed to remain for 30 minutes and then taken out and weighed immediately after wiping the excess fluid (W_2).

3.3 Calculation of Initial Retention — The amount of preservative solution absorbed by block (retention value g/cm³) shall be calculated as follows:

$$\text{Retention } (R) = \frac{GC}{100\,V} \text{ g/cm}^3 \text{ (this may be converted to kg/m}^3\text{)}$$

where

G = the weight of the treating solution absorbed by the block ($W_2 - W_1$) in g,

C = weight of the preservative in 100 g of treating solution in g, and

V = the volume of the block in cm³.

3.3.1 After treatment, the blocks shall be kept for 72 hours in the laboratory. The blocks shall be further dried for 3 h at 50 ± 1°C in a ventilated oven provided with a fan.

3.4 Conditioning for Determination of Residual Toxicity After Exposure to Leaching — If it is required to test the resistance of the preservative to severe leaching the procedure given in **3.4.1** will be followed.

3.4.1 A duplicate series of six blocks in each retention group will be subjected to leaching. If the preservative used is of water borne type of preservative in which fixation requires some time for its completion the treated blocks after being subjected to operations mentioned in **3.3.1** shall then be kept for two weeks in a closed vessel out of contact with one another exposed to vapours of 5 ml of toluene to prevent mould growth. Blocks that have been treated with preservative dissolved in organic solvent should be allowed to dry for four weeks freely exposed in the laboratory. The test blocks after impregnation and pre-condition shall be continuously leached in condensed water in a glass trough for 100 h at 40 ± 5°C. The water in the trough shall be changed after every 8 h of leaching.

4. MEDIUM FOR GROWING CULTURE

4.1 Culture medium of the following composition shall be prepared:

a) Ammonium nitrate (NH_4NO_3)	3·0 g
b) Potassium monohydrogen phosphate ($K_2H\,PO_4$)	2·0 g
c) Potassium dihydrogen phosphate ($KH_2\,PO_4$)	2·5 g
d) Magnesium sulphate ($MgSO_4{\cdot}7H_2O$)	0·5 g
e) Ferrous sulphate ($FeSO_4$)	0·3 g
f) Agar	20 g
g) Distilled water	1 000 ml

4.1.1 The dry ingredients shall be dissolved in distilled water employing an autoclave at reduced pressure or a water bath, and avoiding desiccation and burning. The loss of water due to evaporation shall be made up. Sixtyfive ml of this medium shall be poured into each Kolle flask, and plugged with cotton wool and sterilized by autoclaving at 1·054 kg/cm^2 (120°C) for a period of 20 minutes. After sterilization the flask shall be laid flat so that the medium is retained by the ridge in the neck of the flask.

4.2 Inoculation — Test tube cultures of *Chatomium globosum* Kunze on malt agar shall be started 2 to 3 weeks before the test is undertaken.

4.2.1 A suspension of spores shall be prepared, which may be done conveniently by adding a few drops of distilled water to the test tube containng the culture and then scraping the fungus with a stiff sterilized wire to iberate the spores. Sufficient sterilized distilled water shall be added to the ube and shaken vigorously to break up the spores. This spore suspension hall then be filtered through sterile glass wool in a funnel to remove the arger particles. An automiser that can give a fine spray and which can be letached from and sterilized separately from its rubber tube and bulb hall be used.

4.2.2 Two sterile pieces of ashless filter paper 5 × 5 cm shall be placed n the surface of the medium in the flask and sprayed with the suspension f spores.

4.2.3 The flask shall then be incubated for 3 days at 30 ± 0·5°C by which ime the growth should have become visible.

4.3 Infection of Blocks — Before putting the 6 treated test blocks at each concentration along with 6 untreated control in flask, they should be placed by retention group into tightly fitting containers and steamed at 100°C for 20 min at atmospheric pressure. After cooling the test block shall be placed firmly on the three days old mycelial mat not more than two blocks of the same retention group being placed in each flask in such a way that do not touch each other. After being placed the blocks shall be sprayed with freshly prepared spore suspension.

5. INCUBATION AND DURATION OF TEST

5.1 The flask containing the test block shall be placed in the incubator maintained at 30 ± 0·5°C and kept there for a period of 6 weeks. In order to maintain the conditions ideal for the fungal growth sterile water should be added aseptically to moisten the cotton wool pad in the neck of the flask.

6. EXAMINATION OF TEST BLOCKS AFTER EXPOSURE TO ATTACK

6.1 At the end of the incubation period the blocks shall be removed from the flask cleaned of the adhesing mycelium taking care not to remove the splinters of wood and weigh them immediately for determining the moisture content in the blocks. The blocks shall then be oven dried at 100 to 105°C for 18 h and weighed again as the final weight (W_3).

6.1.1 The loss in weight due to decay shall be obtained by substracting the final dry weight from the initial weight. An addition will be made to the initial weight to allow for the dry weight of the preservative absorbed only when the concentration of the treating solution exceeds 1 percent of a salt and 2 percent of an oil when the preservative is partly volatile at 100°C, allowance shall be made for this loss in weight due to partial evaporation of preservative, by having a series of blocks treated in exactly the same manner as those exposed to fungal attack except that the flask in which they shall be kept will be without fungus and incubated under sterile condition. The losses in weight due to evaporation of preservative determined for these blocks can then be applied as a correction to the experimental series and true losses due to decay thus determined,

6.1.2 The loss in weight resulting from decay shall be expressed as a percentage of the initial dry weight of the wood. A loss in weight less than 3 percent shall be considered as falling within the experimental error.

$$\text{Weight loss, percent} = \frac{W_3 - W_2}{W_2} \times 100$$

INDIAN STANDARDS INSTITUTION

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002
Telephones : 331 01 31, 331 13 75 Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :	*Telephone*
*Western : Manakalaya, E9 MIDC, Marol, Andheri (East), BOMBAY 400093	6 32 92 95
†Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054	36 24 99
Southern : C. I. T. Campus, MADRAS 600113	41 24 42
Northern : B69 Phase VII, Industrial Focal Point, S. A. S. NAGAR 160051 (Punjab)	8 79 26
Branch Offices :	
'Pushpak' Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001	2 63 48 2 63 49
'F' Block Unity Bldg, Narasimharaja Square, BANGALORE 560002	22 48 05
Gangotri Complex, Bhadbhada Road, T. T. Nagar, BHOPAL 462003	6 27 16
22E Kalpana Area, BHUBANESHWAR 751014	5 36 27
5-8-56C L. N. Gupta Marg, HYDERABAD 500001	22 10 83
R14 Yudhister Marg, C Scheme, JAIPUR 302005	6 98 32
117/418 B Sarvodaya Nagar, KANPUR 208005	4 72 92
Patliputra Industrial Estate, PATNA 800013	6 23 05
Hantex Bldg (2nd Floor), Rly Station Road, TRIVANDRUM 695001	32 27
Inspection Office (With Sale Point) :	
Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005	5 24 35

---

*Sales Office in Bombay is at Novelty Chambers, Grant Road, Bombay 400007 89 65 28

†Sales Office in Calcutta is at 5 Chowringhee Approach, P O. Princep Street, Calcutta 700072 27 68 00

Reproduced by Reprography Unit, ISI, New Delhi